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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/789,189 | 02/27/2004 | John Wade | 200313255-1 | 6944 |
| 22879 | 7590 | 05/15/2006 | EXAMINER | |
| HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400 | | | HUFFMAN, JULIAN D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2853 | |

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

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|------------------------------|-------------------|--------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/789,189 | WADE, JOHN | |
| | Examiner | Art Unit | |
| | Julian D. Huffman | 2853 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 9, 10, 18, 20, 21 and 25-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-8, 11, 12, 15-17, 19 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 13 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/20, 6/3, 2/27.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Claims 9, 10, 18, 20, 21, and 25-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 21 February 2006.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 6, 8, 11, 12, 17, 19 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Tamura (U.S. 20010033305 A1).

Tamura discloses:

With regards to claim 1, a fluid ejection device (fig. 3) comprising:

a plurality of fluid ejecting elements (25A-25D), each fluid ejecting element controllable to conduct electrical current between a supply voltage (VH) and a reference voltage (GH), wherein up to all fluid ejecting elements of a group of the plurality of fluid ejecting elements are configured to conduct during a time period (0006-0007, fluid ejection elements are divided into blocks and driven block by block) , with

each conducting fluid ejecting element having a corresponding fluid ejecting voltage when conducting; and

a feedback circuit (elements 37-39 constitute a feedback circuit) configured to provide a feedback voltage substantially equal to an average of corresponding fluid ejecting voltages at the fluid ejecting elements that are conducting (the feedback circuit receives supply and reference voltages from signal lines connected in parallel to each ejection device such that the resulting voltages represent an average of fluid ejecting voltages of the fluid ejecting devices).

With regards to claim 2, the fluid ejection device of claim 1, wherein each fluid ejecting element is coupled between a shared supply path (VH) at the supply voltage and a shared return path (GH) at the reference voltage and to a separate control line (input to transistor), wherein each fluid ejecting element is configured to conduct electrical current from the shared supply path to the shared return path in response to a signal received via its separate control line (0047).

With regards to claim 6, the fluid ejection device of claim 1, wherein the reference voltage comprises a ground reference (GH).

With regards to claim 8, the fluid ejection device of claim 1, wherein each of the N fluid ejecting elements is configured to conduct electrical current in response to a separate fire signal and wherein the feedback circuit is configured to couple across each conducting fluid ejecting element based on the separate fire signals (0047).

With regards to claim 11, a fluid ejection device (fig. 3) comprising:
a plurality of resistors (25A-25D);

a group of the resistors, each resistor controllable to provide energy to a fluid, wherein up to all resistors of the group are configured to provide energy to the fluid during a time period, with each resistor having a corresponding voltage when providing energy (0006-0007); and

a feedback circuit (37-39) configured to provide a feedback voltage substantially equal to an average of the voltage of each resistor that is providing energy.

With regards to claim 12, the fluid ejection device of claim 11, wherein each resistor is coupled between a supply voltage (VH) and a reference voltage (GH) and to a separate control line, wherein each resistor is configured to conduct electrical current from the shared supply path to the shared return path in response to a fire signal received at a logic element that is coupled with the resistor via a separate control line (0047).

With regards to claim 17, the fluid ejection device of claim 11, wherein each of the resistors are configured to conduct electrical current in response to a separate fire signal and wherein the feedback circuit is configured to couple across each conducting resistor based on the separate fire signals (0047).

With regards to claim 19, a method of operating a fluid ejection device having a plurality of resistors (25A-25D) controllable to conduct electrical current between a supply voltage (VH) and a reference voltage (GH), the method comprising:

enabling a group of the plurality of resistors to conduct electrical current (0006-0007);

conducting an electrical current through up to all resistors of the group, each conducting resistor having a corresponding voltage; and

determining a feedback voltage substantially equal to an average of selected corresponding voltages (37-39).

With regards to claim 24, a fluid ejection device (fig. 3) having a plurality of fluid ejecting elements (25A-25D) controllable to conduct electrical current between a supply voltage (VH) and a reference voltage (GH), the fluid ejection device comprising:

a means for enabling a group of the plurality of fluid ejecting elements to conduct electrical current;

a means (35) for conducting an electrical current through up to all fluid ejecting elements of the group, with each conducting fluid ejecting element having a corresponding fluid ejecting voltage; and

a means (37-39) for determining a feedback voltage that is substantially equal to an average of selected corresponding fluid ejecting voltages.

4. Claims 19 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Badyal et al. (U.S. 5,083,137).

Badyal et al. discloses:

With regards to claim 19, a method of operating a fluid ejection device (fig. 6) having a plurality of resistors (RH) controllable to conduct electrical current between a supply voltage (VHH) and a reference voltage (VG), the method comprising:

enabling a group of the plurality of resistors to conduct electrical current (column 6, lines 22-25 and 40-42);

conducting an electrical current through up to all resistors of the group, each conducting resistor having a corresponding voltage; and

determining a feedback voltage substantially equal to an average of selected corresponding voltages (column 7, lines 19-40, the term "selected corresponding voltages" is not defined and thus the feedback voltage may be said to be an average of any plurality of corresponding voltages).

With regards to claim 24, a fluid ejection device (fig. 6) having a plurality of fluid ejecting elements (RH) controllable to conduct electrical current between a supply voltage (VHH) and a reference voltage (VG), the fluid ejection device comprising:

a means for enabling a group of the plurality of fluid ejecting elements to conduct electrical current (22);

a means for conducting an electrical current through up to all fluid ejecting elements of the group (VHH), with each conducting fluid ejecting element having a corresponding fluid ejecting voltage; and

a means (20) for determining a feedback voltage that is substantially equal to an average of selected corresponding fluid ejecting voltages (column 7, lines 19-40, the term "selected corresponding voltages" is not defined and thus the feedback voltage may be said to be an average of any plurality of corresponding voltages).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, 7, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura in view of Hawkins et al. (U.S. 4,947,192).

Tamura discloses everything claimed with the exception of the N fluid ejecting elements and the feedback circuit formed on a thin-film structure formed on a substrate including a non-conductive material selected from a group consisting of an oxide formed on a metal, carbon composite material, a ceramic material and glass and the ejecting elements configured in a row that extends substantially for a width of a print media to be inserted into the fluid ejection assembly.

However, Hawkins et al. disclose forming transistors and resistors in a thermal ink jet printing system on a single substrate including glass (fig. 3, element 84) and a stationary page width printhead (column 2, lines 48-51).

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the teachings of Hawkins et al. into the invention of Tamura by forming the ejecting elements and feedback circuit on a thin-film structure formed on a substrate including a glass for the purpose of providing a more compact structure (column 2, line 14) with a planarized surface (column 4, lines 45-48) and by configuring the ejection elements in a row that extends substantially for a width of a print media for the purpose of increasing printing speed and eliminating the need for a carriage.

7. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Badyal et al. (U.S. 5,0832,137) in view of Holstun (U.S. 6,217,147 B1).

Badyal et al. discloses grouping nozzles into primitives and firing resistors from different primitives simultaneously.

Badyal et al. does not disclose enabling a different group of resistors for each subsequent ejection operation or forming a different enabled group for a subsequent ejection operation by disabling a resistor of the enabled group for a previous ejection operation and enabling a resistor not included in the enabled group for the previous ejection operation.

However, Holstun discloses enabling a different group of resistors for each subsequent ejection operation or forming a different enabled group for a subsequent ejection operation by disabling a resistor of the enabled group for a previous ejection operation and enabling a resistor not included in the enabled group for the previous ejection operation (fig. 12, column 6, lines 15-34).

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the driving arrangement of Holstun into the invention of Badyal et al. for the purpose of ensuring that only one ink ejection element in a primitive fires at a given time thereby ensuring that the proper amount of energy is delivered to each firing element (column 6, lines 15-34).

Allowable Subject Matter

8. Claims 3, 4, 13 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 10:00a.m.-6:30p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Julian D. Huffman
Art Unit 2853
30 April 2006